Lars Magnus Hvattum

Born:	17th of June 1979, in Molde, Norway
Family:	Married, one child
Profession:	Professor of Quantitative Logistics
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Education

PhD in Logistics, Molde University College, Norway (2007).

Cand. Scient. in Informatics, University of Bergen, Norway (2003).

Cand. Mag. in Informatics/Mathematics, Molde College, Norway (2002).

Ex. Phil., University of Bergen, Norway (2001).

Work Experience

Vice-Rector for Research at Molde University College (since 2023).

Professor of Quantitative Logistics at Molde University College (since 2015).

Professor of Industrial Economics and Optimization at Department of Industrial Economics and Technology Management (IØT), Norwegian University of Science and Technology (NTNU) (2011–2015).

Associate Professor at IØT, NTNU (2011).

Postdoctoral Fellow at IØT, NTNU (2008–2011).

Consultant for the Norwegian Marine Technology Research Institute (2008).

Research Fellow at Molde University College (2004–2007).

Intern at SINTEF Applied Mathematics (summers of 2001, 2002, 2003).

Peer-reviewed Publications

[1] H. Bentsen, A. Reznik, and L. M. Hvattum. Testing initial solutions in a variable neighborhood search for binary integer programming problems. *International Journal of Metaheuristics*, forthcoming.

[2] A. Konovalenko, L. M. Hvattum, S. Urrutia. Two paradigms for combining optimization and satisfiability: maximum satisfiability and optimum satisfiability problems. *Journal of Information and Optimization Sciences*, forthcoming.

[3] A. Bisadi, A. Zare, and L. M. Hvattum. Optimizing spare part management for vessels in liner shipping. In T. Bányai, editor, *Recent Topics in Maintenance Management*, 2024.

[4] J. Sgall, J. Balogh, J. Békési, G. Dósa, L. M. Hvattum, and Zs. Tuza. No tiling of the 70×70 square with consecutive squares. In A. Z. Broder and T. Tamir, editors, *12th International Conference on Fun with Algorithms (FUN 2024)*, volume 291 of *Leibniz International Proceedings in Informatics (LIPIcs)*, pages 28:1–28:16. Schloss Dagstuhl – Leibniz-Zentrum für Informatik, Germany, 2024.

[5] J. Skålnes, M. Ben Ahmed, L. M. Hvattum, and M. Stålhane. New benchmark instances for the inventory routing problem. *European Journal of Operational Research*, 313:992–1014, 2024.

[6] H. Shaabani, L. M. Hvattum, G. Laporte, and A. Hoff. A goal programming model for the stability analysis of a maritime inventory routing replanning problem. *Maritime Transport Research*, 5, 100101, 2023.

[7] K. Fagerholt, L. M. Hvattum, D. Papageorgiou, and S. Urrutia. Maritime inventory routing: recent trends and future directions. *International Transactions in Operations Research*, 30:3013–3056, 2023.

[8] P. S.-U. Gjøen, S. A. Hvattum, E. M. Moltubak, and L. M. Hvattum. When is 2 better than 3 in basketball? *Statistica Applicata – Italian Journal of Applied Statistics*, 35, 2023.

[9] G. Abraham, G. Dósa, L. M. Hvattum, T. Olaj, and Zs. Tuza. The board packing problem. *European Journal of Operational Research*, 308:1056–1073, 2023.

[10] A. Algendi, S. Urrutia, and L. M. Hvattum. Optimizing production levels in maritime inventory routing with load-dependent speed optimization. *Flexible Services and Manufacturing Journal*, 35:111–141, 2023.

[11] M. Ben Ahmed, A. Agra, and L. M. Hvattum. The effect of different mathematical formulations on a matheuristic algorithm for the production routing problem. *Computers and Operations Research*, 155:106232, 2023.

[12] H. Van Eetvelde, L. M. Hvattum, and C. Ley. The probabilistic final standing calculator: a fair stochastic tool to determine the final ranking of abruptly stopped football seasons. *AStA Advances in Statistical Analysis*, 107:251–269, 2023.

[13] H. Shaabani, A. Hoff, L. M. Hvattum, and G. Laporte. A matheuristic for the multi-product maritime inventory routing problem. *Computers and Operations Research*, 154, 106214, 2023.

[14] S. Moazzeni, S. Mostafayi Darmian, and L. M. Hvattum. Multiple criteria decision making and robust optimization to design a development plan for small and medium-sized enterprises in the east of Iran. *Operational Research*, 23:13, 2023.

[15] L. M. Hvattum, M.-A. Kriegl and M. Čulík. Identifying talent with plus-minus ratings in association football. In Y. Dominicy and C. Ley, editors, *Statistics Meets Sports: What We Can Learn from Sports Data*, pages 175–200. Cambridge Scholars Publishing, Newcastle, UK, 2023.

[16] S. H. Knudseth, E. Molland, A. Hoff, L. M. Hvattum, and J. Oppen. Decision support for allocating farmed fish to customer orders using a bi-objective optimization model. *Decision Making in Manufacturing and Services*, 16:67–90, 2022.

[17] H. Bentsen and L. M. Hvattum. Variable neighborhood search for binary integer programming problems. *International Journal of Metaheuristics*, 8:1–26, 2022.

[18] J. Balogh, G. Dósa, L. M. Hvattum, T. Olaj, and Zs. Tuza. Guillotine cutting is asymptotically optimal for packing consecutive squares. *Optimization Letters*, 16:2775–2785, 2022.

[19] J. Pluskal, R. Šomplák, D. Hrabec, V. Nevrlý, and L. M. Hvattum. Optimal location and operation of waste-to-energy plants when future waste composition is uncertain. *Operational Research*, 22:5765-5790, 2022.

[20] A. Zojaji, K. Soltaniani, L. M. Hvattum, and S. Urrutia. Cyclic solutions to a maritime inventory routing problem. *Maritime Transport Research*, 3, 100074, 2022.

[21] L. M. Hvattum. Adjusting the order crossover operator for capacitated vehicle routing problems. *Computers and Operations Research*, 148, 105986, 2022.

[22] H. Bentsen, A. Hoff, and L. M. Hvattum. Exponential extrapolation memory for tabu search. *EURO Journal on Computational Optimization*, 10, 100028, 2022.

[23] F. Rodrigues, A. Agra, L. M. Hvattum, and C. Requejo. Weighted iterated local branching for mathematical programming problems with binary variables. *Journal of Heuristics*, 28:329–350, 2022.

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[25] D. Hrabec, L. M. Hvattum, and A. Hoff. The value of integrated planning for production, inventory, and routing decisions: A systematic review and meta-analysis. *International Journal of Production Economics*, 248, 108468, 2022.

[26] K. H. Bolstad, M. Joshi, L. M. Hvattum, and M. Stålhane. Composing vessel fleets for maintenance at offshore wind farms by solving a dual-level stochastic programming problem using GRASP. *Logistics*, 6, 6, 2022.

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[28] H. Arntzen and L. M. Hvattum. Predicting match outcomes in association football using team ratings and player ratings. *Statistical Modelling*, 21:449–470, 2021.

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[30] H. F. Amaral, S. Urrutia, and L. M. Hvattum. Delayed improvement local search. *Journal of Heuristics*, 27:923–950, 2021.

[31] G. Pantuso and L. M. Hvattum. Maximizing performance with an eye on the finances: a chance-constrained model for football transfer market decisions. *TOP*, 29:583–611, 2021.

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[33] R. F. da Silva, S. Urrutia, and L. M. Hvattum. Extended high dimensional indexing approach for reachability queries on very large graphs. *Expert Systems with Applications*, 181, 114962, 2021.

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[48] G. Dósa, L. M. Hvattum, T. Olaj, and Zs. Tuza. The board packing problem: Packing rectangles into a board to maximize profit. In I. Vassányi, editor, *Proceedings of the Pannonian Conference on Advances in Information Technology (PCIT 2020)*, pages 10–16. University of Pannonia, Veszprém, Hungary, 2020.

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[65] S. Braaten, O. Gjønnes, L. M. Hvattum, and G. Tirado. Heuristics for the robust vehicle routing problem with time windows. *Expert Systems with Applications*, 77:136–147, 2017.

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[100] L. M. Hvattum and H. Arntzen. Using ELO ratings for match result prediction in association football. *International Journal of Forecasting*, 26:460–470, 2010.

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Theses

[113] L. M. Hvattum. Heuristics for stochastic vehicle and inventory routing problems. PhD Thesis. Molde University College, Norway, 2007. Parts of this material can be found in [101, 102, 106, 107].

[114] L. M. Hvattum. Heuristics for a stochastic vehicle routing problem. Cand. Scient. Thesis. University of Bergen, Norway, 2003. Parts of this material can be found in [107, 111].

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Publications without Peer-review

[116] A. Groll, L. M. Hvattum, C. Ley, F. Popp, G. Schauberger, H. Van Eetvelde, and A. Zeileis. Hybrid machine learning forecasts for the UEFA EURO 2020. *CoRR*, arXiv:2106.05799, June 2021.

Submitted Papers

[117] G. Pantuso and L. M. Hvattum. Spotting football stars.

[118] T. D'Amelio and L. M. Hvattum. The existence of firm-specific human capital in professional association football.

[119] H. Shaabani, L. M. Hvattum, G. Laporte, and A. Hoff. Stability metrics for a maritime inventory routing problem under sailing time uncertainty.

[120] J. Balogh, G. Dósa, L. M. Hvattum, T. A. Olaj, I. Szalkai, and Zs. Tuza. Covering a square with consecutive squares.

[121] L. M. Hvattum. Where to split in hybrid genetic search for the capacitated vehicle routing problem.

[122] A. Algendi, S. Urrutia, L. M. Hvattum, and B. I. Helgheim. Home health care staffing, routing, and scheduling problem with multiple shifts and emergency considerations.

[123] U. Bosnjak, O. L. Vigerust, M.-A. Kriegl, M. Stålhane, and L. M. Hvattum. The relationship between playing style, performance, and market value in top level association football.

[124] A. Konovalenko and L. M. Hvattum. Optimizing a dynamic vehicle routing problem with deep reinforcement learning: analyzing state space components.

Conference Presentations

Improving a hybrid genetic search for the capacitated vehicle routing problem. EURO 2024, Copenhagen, Denmark, June 30–July 3, 2024.

Plus-minus ratings for association football: Feasible? Reasonable? Useful? First Molde workshop on Sports Analytics, Molde, Norway, October 25, 2019.

Maximizing financial and on-field performances when composing teams in soccer. MathSport 2019, Athens, Greece, July 1–3, 2019 (with G. Pantuso).

Exploring properties of combining solutions of the Boolean optimization problem. EURO 2019, Dublin, Ireland, June 23–26, 2019 (with R. F. da Silva and F. Glover).

Profit maximization in inventory routing problems. IEEM 2018, Bangkok, Thailand, December 16–19, 2018 (with A. Zaitseva and S. Urrutia).

Modelling clubs' financial investment in association football players. MathSport 2017, Padua, Italy, June 26–28, 2017 (with O. D. Sæbø).

Solving complex optimization problems in practical settings based on findings in the research literature. Fred80fest, Boulder, CO, USA, March 9–10, 2017.

Statistical analysis of randomization in adaptive large neighborhood search. EURO 2016, Poznań, Poland, July 3–6, 2016 (with A. Hemmati).

Evaluating the efficiency of the association football transfer market using regression based player ratings. NIK 2015, Ålesund, Norway, November 23–25, 2015 (with O. D. Sæbø).

Routing and scheduling of vessels to perform maintenance tasks at offshore wind farms. CM3, Jyväskylä, Finland, May 25–27, 2015 (with M. Stålhane, N. Raknes, and K. Ødeskaug).

Time is of the essence in stochastic and dynamic maritime routing and scheduling problems. LOT, Molde, Norway, September 1–2, 2014 (with G. Tirado).

A maritime inventory routing problem with uncertain travel times. IFORS 2014, Barcelona, Spain, July 13–18, 2014 (with A. Agra, M. Christiansen, and A. Delgado).

A comparison of aspiration criteria in tabu search. LION 8, Gainesville, FL, USA, February 16–21, 2014.

A stochastic programming model for determining a vessel fleet to perform maintenance operations at offshore wind farms. SOAK/NOS6, Gothenburg, Sweden, October 24–26, 2013 (with H. M. Vefsnmo, M. Stålhane, E. E. Halvorsen-Weare, and L. M. Nonås).

Improving solutions for dynamic and stochastic maritime pick-up and delivery problems using local search. MIC 2013, Singapore, August 4–8, 2013 (with G. Tirado).

A two-stage stochastic programming model for determining a vessel fleet to perform maintenance operations at offshore wind farms. EURO XXVI, Rome, Italy, July 1–4, 2013 (with H. M. Vefsnmo, M. Stålhane, E. E. Halvorsen-Weare, and L. M. Nonås).

Incorporating local search in heuristics for dynamic and stochastic maritime pick-up and delivery problems. IEEM 2012, Hong Kong, December 10–13, 2012 (with G. Tirado).

Heuristics for stochastic and dynamic maritime pickup and delivery problems. EURO XXV, Vilnius, Lithuania, July 8–11, 2012 (with G. Tirado, K. Fagerholt, and J.-F. Cordeau).

A stochastic and dynamic maritime pickup and delivery problem. IFORS 2011, Melbourne, Australia, July 10–15, 2011 (with G. Tirado, K. Fagerholt, and J.-F. Cordeau).

Heuristics for a stochastic and dynamic routing problem in industrial shipping. ICOTA 8, Shanghai, China, December 10–13, 2010 (with G. Tirado, K. Fagerholt, and J.-F. Cordeau).

The fleet deployment problem with fairly evenly spread voyages. NOW 2010, Ajaccio, France, August 23–25, 2010 (with H. S. Arnulf, A. Bjørkli, K. Fagerholt, and I. Norstad).

Using decision trees for a stochastic maritime routing problem. EURO XXIV, Lisbon, Portugal, July 11–14, 2010 (with E. F. Esbensen, K. Fagerholt, and B. Nygreen).

Routing and scheduling of roll-on/roll-off ships with simultaneous cargo selection and stowage decisions. TRISTAN VII, Tromsø, Norway, June 20–25, 2010 (with B. O. Øvstebø and K. Fagerholt).

Scenario tree based heuristics for stochastic inventory routing problems. INFORMS 2009 Annual Meeting, San Diego, CA, USA, October 11–14, 2009 (with A. Løkketangen and G. Laporte).

Scenario trees and metaheuristics for stochastic inventory routing problems. DOMinant workshop, Molde, Norway, September 20–22, 2009 (with A. Løkketangen and G. Laporte).

On the value of aspiration criteria in tabu search. MIC 2009, Hamburg, Germany, July 13–16, 2009.

Heuristics for stochastic vehicle and inventory routing problems. EURO XXIII, Bonn, Germany, July 5–8, 2009.

Neighborhood exploration using MIP solvers for a tank allocation problem. EURO XXIII, Bonn, Germany, July 5–8, 2009 (with K. Fagerholt and V. A. Armentano).

Routing and scheduling of RoRo-ships with stowage constraints. ROUTE 2009, Skodsborg, Denmark, June 21–24, 2009 (with B. O. Øvstebø and K. Fagerholt).

Stowage planning for RoRo-ships. Optimization Days 2009, Montréal, Canada, May 4–6, 2009 (with B. O. Øvstebø and K. Fagerholt).

Tank allocation problems in maritime bulk shipping. OR50, York, England, September 9–11, 2008 (with K. Fagerholt and V. A. Armentano).

When feasibility of routes is difficult to determine: an example from maritime bulk shipping. VIP'08, Oslo, Norway, June 12–14, 2008 (with K. Fagerholt and V. A. Armentano).

Stowage planning in maritime bulk shipping. ECCO XXI, Dubrovnik, Croatia, May 29–31, 2008 (with K. Fagerholt and V. A. Armentano).

Finding local optima of high-dimensional functions using direct search methods. EURO XXII, Prague, Czech Republic, July 8–11, 2007 (with F. Glover).

Using scenario trees and progressive hedging for stochastic inventory routing problems. INFORMS 2006 Annual Meeting, Pittsburgh, PA, USA, November 5–8, 2006 (with A. Løkketangen and G. Laporte).

Heuristics for stochastic inventory routing problems. CORS/Optimization Days 2006, Montréal, Canada, May 8–10, 2006 (with A. Løkketangen and G. Laporte).

Experiments using scatter search for the multidemand multidimensional knapsack problem. MIC 2005, Vienna, Austria, August 22–26, 2005 (with A. Løkketangen).

A two-phase staged heuristic for stochastic and dynamic vehicle routing problems. ROUTE 2005, Bertinoro, Italy, June 23–26, 2005 (with A. Løkketangen and G. Laporte).

A two-phase staged heuristic for stochastic and dynamic vehicle routing problems. Workshop on Solving Rich VRP Models, Molde, Norway, June 16–17, 2005 (with A. Løkketangen and G. Laporte).

A heuristic solution method to a stochastic vehicle routing problem. TRISTAN V, Le Gosier, Guadeloupe (French West Indies), June 13–18, 2004 (with A. Løkketangen and G. Laporte).

New heuristics and adaptive memory procedures for the Boolean optimization problem. Optimization Days 2004, Montréal, Canada, May 10–12, 2004 (with A. Løkketangen and F. Glover).

A heuristic solution method to a stochastic vehicle routing problem. NIK 2003, Oslo, Norway, November 24–26, 2003 (with A. Løkketangen and G. Laporte).

Adaptivt lokalsøk for boolske optimeringsproblemer. NIK 2002, Kongsberg, Norway, November 25–27, 2002 (with A. Løkketangen and F. Glover).

Iterative and constructive learning based heuristics for Boolean optimization problems. Nordic MPS'02, Bergen, Norway, September 19–21, 2002 (with A. Løkketangen and F. Glover).

Surrogate constraint guidance for Boolean optimization problems. IFORS 2002, Edinburgh, Scotland, July 8–12, 2002 (with A. Løkketangen and F. Glover).

Other Presentations

Havvind og optimal logistikk for vedlikehold (in Norwegian). Research Days 2021, Molde University College, September 2021.

Regression-based player ratings in soccer. SAL/SIS Sports Analytics Seminar, online, November 6, 2020.

An introduction to plus-minus ratings for football players. Quetelet seminar at Ghent University, Ghent, Belgium, February 17, 2020.

Heuristics for stochastic and dynamic maritime routing and scheduling problems. Seminar at Center for R&D in Mathematics and Applications, University of Aveiro, Aveiro, Portugal, October 29, 2014.

Optimization of stowage planning in maritime transportation. Presentation at Facultad de Ciencias Matemáticas, Universidad Complutense de Madrid, Madrid, Spain, October 20, 2008.

Dynamic and stochastic vehicle routing problems. Seminar at the Dept. of Industrial Economics and Technology Management, the Norwegian University of Science and Technology, Trondheim, Norway, October 22, 2007.

Scenario tree based heuristics for stochastic inventory routing problems. Systems seminar at the Leeds School of Business, University of Colorado at Boulder, Boulder, CO, USA, October 27, 2006.

Heuristics for stochastic inventory routing problems. Seminar at the Centre for Research on Transportation and the Canada Research Chair in Distribution Management, Montréal, Canada, March 17, 2006.

A stochastic and dynamic VRP: heuristic solution methods, part 2. Presentation at SINTEF Applied Mathematics, Oslo, Norway, September 5, 2005.

A stochastic and dynamic VRP: heuristic solution methods. Presentation at SINTEF Applied Mathematics, Oslo, Norway, October 8, 2004.

Popular Dissemination

Interviewed for article by The Athletic, May 25, 2024: Why do the numbers show that Real Madrid do better without Toni Kroos?

Interview published by Panorama, June 11, 2021, based on [116]: Molde-forsker peker ut Frankrike som EM-favoritt (in Norwegian).

Interview published by rbnett, April 5, 2019, based on [53]: Professor: - Denne spilleren er viktigst for at Molde skal vinne (in Norwegian).

Interview published by Panorama, March 29, 2019, based on [53]: Simulerte Eliteserien 2019 basert på spillerstyrke: Mest sannsynlig at RBK tar gullet (in Norwegian).

Hosting the YouTube channel Football Player Ratings, presenting material based on [28, 31, 41, 45, 51, 53, 74] (since 2017).

Interview published by Panorama, November 3, 2015, based on [75]: Kunstgressfordel på 2,5 poeng per sesong (in Norwegian).

Published and maintained the smart phone app Football League Simulator, which used regression and simulation to forecast final league placements in association football league tournaments based on [85] (2012–2018).

Selected Teaching Experience

Models for Production Management, LOG713, Molde University College, 2015–2020, 2023.

Applied Supply Chain Management, SCM703, Molde University College, 2023.

Heuristics in Analytics, LOG734, Molde University College, 2018–2023.

Research Design, LOG904-101, Molde University College, 2019–2022.

Heuristics for Stochastic Optimization, DRL027, Molde University College, 2019, 2021.

Exact Optimization Methods in Logistics, LOG733, Molde University College, 2016–2020.

Operations Research, Introduction, TIØ4120, NTNU, 2011–2014.

Management Science Modeling, TLOG2003, Sør-Trøndelag University College, 2014.

Industrial Optimization and Decision Support, TIØ4150, NTNU, 2013.

Optimization in Maritime Transportation, IØ8402, NTNU, 2008, 2013.

Optimization and Decision Support for Industrial Business Planning, TIØ4126, NTNU, 2009–2012.

Optimization in Transport and Process Production, TIØ5, NTNU, 2008.

Heuristic Optimization Methods, INF740, Molde University College, 2007.

Programming Languages and Compiler Techniques, IN330, Molde University College, 2004.

Educational Training

NTNU educational training course, 2012.

One-day course in lecture dramaturgy by Company Stories, 2011.

NTNU educational training course, module for teaching large groups, 2011.

Supervised (and Co-supervised) PhD Students

Abdalrahman Algendi, *The use of data mining, artificial intelligence, and optimization to improve home health care logistics* (co-supervisor, since 2022).

Nina Hulleberg, *Metro crowding and capacity utilization in the Oslo area* (main supervisor, since 2021).

Darya Hrydziushka, *Multimodal emergency response system for humanitarian logistics*, (co-supervisor, since 2021).

Alessandro Di Mattia, *On effects of tournament design in sports competitions* (co-supervisor, since 2021).

Anna Konovalenko, *Formulation and optimization of OptSAT problems* (main supervisor, since 2021; co-supervisor, 2020).

Erik Langelo, *The profit-maximizing lot size problem with marketing and lag effects* (main supervisor, since 2019).

Homayoun Shaabani, *Multi-product maritime inventory routing problem under uncertainty* (co-supervisor, 2019–2023).

Håkon Bentsen, *Heuristics for binary integer programming problems* (main supervisor, 2017–2023).

Mohamed Ben Ahmed, *Matheuristics for inventory routing problems* (main supervisor, 2018–2023).

Markus Brachner, *Evaluating and optimizing an emergency response system for helicopter transportation in the Arctic region* (main supervisor, 2015–2019; co-supervisor, 2013–2015).

Anders Nordby Gullhav, *Optimization-based resource allocation in cloud computing* (co-supervisor, 2011–2016).

Urooj Pasha, *Solution methods for fleet composition and routing problems* (co-supervisor, 2013–2015).

Ahmad Hemmati, *Heuristics for rich maritime inventory routing problems* (main supervisor, 2011–2015).

Supervised (and Co-supervised) MSc Students

Tobias Kolstø Bergeland and Per Olav Broback, *Analyzing the impact of speed optimization in maritime inventory routing*, 2024.

Oskar Bernard Aase and Elias Ingebretsen Joa, *Predicting football game outcomes and post-transfer player performance with machine learning using a bottom-up approach to player ratings*, 2024.

Arameh Bisadi and Amir Zare, *Maritime maintenance spare part inventory management*, 2023.

Simen Johan Fjælberg, *Cyclic maritime inventory routing with variable time horizon*, 2023.

Lars Hegg Gundersen, Markus Malum Kim, and Eliot Karlsen Strobel, *Analyzing and predicting performances and playing styles of football players*, 2022.

Una Bosnjak and Olav Lund Vigerust, *Playing style and performance in association football: how to invest smarter*, 2022.

Valeriia Mikheeva, *Planning and optimization of the petroleum products distribution network*, 2022.

Denis Senokosov and Rebecca Nerland, *RadPathFinder: an application for finding optimal paths in a radiation environment*, 2022.

Mikita Shuldau and Volha Mialeshka, *Inventory management under uncertainty for Delmar Systems*, 2022.

Amir Zojaji and Kiarash Soltaniani, *Modelling a cyclic maritime inventory routing problem*, 2022.

Thomas Alexander Lindberg and Kristian Schnell, *Designing a forecast-based optimization framework for competing in the Fantasy Premier League*, 2021.

Alexandr Reznik, *Heuristics for binary integer programming problems*, 2021.

Even Molland and Sunniva Haukvik Knudseth, *Allocating farmed fish to customer orders using multi-objective optimization*, 2021.

Otto Petter Thomassen, *Discrete event simulation for an inventory rental problem at Deep Sea Mooring*, 2021.

Tristan Kristoffer Cook, Eivind Keil, and Inge Dovre Sætherø, *Modelling off-ball decision making in Swedish top division football*, 2020.

Daniel Moreno Rendón, *Development and integration of vehicle routing concepts for the decision making: A case study for a third party logistics in Mexico*, 2020.

Sadok Aguel and Thi Thao Uyen Ngo, *Analyzing the effect of time-dependent travel times on last-mile deliveries*, 2020.

Maryia Hryhoryeva, *Robust integrated models for airline planning*, 2020.

Robin Andersen and Vegard Hassel, *In-game betting and the FA English Premier League: the contribution of prediction models*, 2019.

Onyemaechi Linda Okoronkwo and Edwin Chimezie Okoronkwo, *Dynamic inventory routing problem with profit maximization*, 2019.

Anna Konovalenko, *Developing a heuristic algorithm for classification of problems with binary attributes*, 2019.

Hans Jacob Brun, *Testing the betting market efficiency with the use of heuristics*, 2019.

Knut Olav Brathaug Sørset and Andres Haugen Vikhagen, *A heuristic approach to the three-dimensional bin packing problem with weight constraints*, 2019.

Maksim Hardziyenak, *Soccer player performance ranking for Molde FK and Norwegian Eliteserien*, 2019.

Else Marie Håland and Astrid Salte Wiig, *Evaluating passing behaviour in association football*, 2018.

Nikolai Mathisen Bratsberg and Anne-Marie Mellbye, *Early-stage real estate development using nonlinear optimization*, 2018.

Line Eide and Gro Cecilie Håhjem Årdal, *Speed optimization in a maritime inventory routing problem*, 2018.

Sindre Loug, *Scheduling of public transport after Ryfast*, 2018.

Anatol Husakou, *Vehicle routing planning for Mjøndalen Mur & Puss AS*, 2018.

Haakon Sveiverud Haave and Håkon Høiland, *Evaluating association football player performances using Markov models*, 2017.

Anna Zaitseva, *Introducing profit maximization in inventory routing problems*, 2017.

Francisca Johnsen and Torkil Rasmussen, *Flexibility in operation theatres*, 2017.

Nataliia Evsikova, *Speed optimization in maritime inventory routing*, 2017.

Kamilla Hamre Bolstad and Manu Joshi, *Heuristics for a dual-level stochastic fleet size and mix problem for maintenance operations at offshore wind farms*, 2016.

Fredrik Berg Stien, *Optimization models for emergency preparedness in the Arctic region*, 2016.

Yassine Louahabi, *The implementation of a bi-temperature warehouse in the northern region of Morocco*, 2016.

Vegard Bjertnes, Olav Nørstebø, and Eirik Vabo, *Valuing individual player involvements in Norwegian association football*, 2016.

Katrine Ødeskaug and Nora Raknes, *Optimal scheduling of maintenance tasks and routing of a joint vessel fleet for multiple offshore wind farms*, 2015.

Pål Eskild Rasmussen and Mads Falmår Wilthil, *A price-based algorithm for multi-player equilibrium problems*, 2015.

Olav Drivenes Sæbø, *Modelling clubs' financial investment in association football players*, 2015.

Vidar Skaar, *Optimization of routing and scheduling for performing maintenance at offshore wind farms*, 2014.

Geir Martin Bakken and Michael Wiik, *Optimal lagerstyring av kontanter i minibanker med usikker etterspørsel (in Norwegian)*, 2014.

Eirik Røysem Haug, *Subsea investments and well placements in the oil production industry*, 2013.

Mats Alfsen, *Optimization of subsea investments*, 2013.

Hanne Merete Vefsnmo, *Determining the optimal vessel fleet for maintenance of offshore wind farms*, 2013.

Sigrid Rennemo and Kristina Fogner Rø, *A multi-stage stochastic facility routing model for humanitarian logistics planning*, 2012.

Sondre Steen, *Fleet deployment optimization in liner shipping*, 2012.

Sofie Døving Agdestein, *Operating room scheduling problem*, 2012.

Ina Blomseth Halvorsen and Christian Gundegjerde, *Vessel fleet size and mix for maintenance of offshore wind farms*, 2012.

Hilde Elise Sæther Lilleby, *Nurse rerostering — a strategic tool for competence building*, 2012.

Rikard Bakkehaug and Eirik Stamsø Eidem, *Strategic fleet renewal in shipping*, 2011.

Hans Sveipe Arnulf and Amund Bjørkli, *Fleet deployment in liner shipping*, 2010.

Lars Lundsbakken and Magnar Vestli, *Scheduling of training missions at a fighter squadron*, 2009.

Bernt Olav Øvstebø, *Optimisation of stowage planning for RoRo-ships*, 2009.

Supervised BSc Students

Eirik Martin Blix Madsen and Marius Bråten, *Hvordan kan Glamox håndtere ujevn arbeidsmengde på varemottaket sitt, og også forbedre varemottaket ved hjelp av LEAN-verktøy? (In Norwegian)*, 2021.

Sondre Holtmo Rød, *Hvordan blir produksjonen i Nekton Havbruk optimalisert, slik at det oppnås en maksimal utnyttelse av matfiskkonsesjoner (in Norwegian)*, 2021.

Mats Mørch, *Quantifying footballing: using multiple regression analysis and ELO ratings to identify the most important KPI's for goalkeepers*, 2020.

PhD Evaluation Committee Work

Ondřej Hubáček, *Sport prediction market modeling with portfolio optimization*, Czech Technical University in Prague, Czechia, 2024.

Phillippe Samer, *Polyhedra and algorithms for problems bridging notions of connectivity and independence*, University of Bergen, Norway, 2023.

Gabrijela Obradović, *Mixed-integer optimization modeling for the simultaneous scheduling of component replacement and repair*, Chalmers University of Technology, Sweden, 2023.

Falko Müller, *Air transport network alterations and their impacts on the accessibility of locations – an assessment framework*, Molde University College, Norway, 2022.

Filipe Manuel Gonçalves Rodrigues, *Inventory routing under uncertainty*, University of Aveiro, Portugal, 2019.

Maria Elbek, *Modeling and optimization of collection problems*, Aarhus University, Denmark, 2018.

Brice Assimizele, *Optimal positioning of tug vessels along the northern Norwegian coast*, Molde University College, Norway, 2017.

Magnus Stålhane, *Optimization of maritime routing and scheduling problems with complicating inter-route constraints*, NTNU, IØT, Trondheim, Norway, 2013.

Jørgen Glomvik Rakke, *Optimization models and methods for maritime routing and scheduling problems*, NTNU, IØT, Trondheim, Norway, 2012.

Elin Espeland Halvorsen-Weare, *Maritime fleet planning and optimization under uncertainty*, NTNU, IØT, Trondheim, Norway, 2012.

Frank Hennig, *Optimization in maritime transportation: crude oil tanker routing and scheduling*, NTNU, IØT, Trondheim, Norway, 2010.

External Examiner

Optimization and Decision Support for Industrial Business Planning, TIØ4126, NTNU, IØT.

Financial Engineering, Specialization Project, TIØ4550, NTNU, IØT.

Master's Thesis in Informatics, INF399, University of Bergen.

Optimization Methods with Applications, TIØ4130, NTNU, IØT.

Complex examination committee member, University of Pannonia, Hungary.

Master's Dissertation in Statistical Data Analysis, Ghent University, Belgium.

Industrial Optimization and Decision Support, TIØ4150, NTNU, IØT.

Master's Thesis in Managerial Economics and Operations Research, TIØ4905, NTNU, IØT.

Management Science Modeling, TLOG2003, NTNU, Department of Mechanical and Industrial Engineering.

Master's Degree Thesis in Logistics, LOG950, Molde University College.

Master's Degree Thesis in Informatics, INF950, Molde University College.

Classical Optimization Methods, LOG735 (INF735), Molde University College.

Managerial Economics and Operations Research, Specialization Project, TIØ4500, NTNU, IØT.

Editorial Assignments

Associate editor for *Omega: The International Journal of Management Science* (since 2020).

Guest editor for a special issue of *Annals of Operations Research* on "Logistics, Optimization and Transportation – in memory of the late Arne Løkketangen", volume 253, issue 2, June 2017.

Editorial board member of *Suranaree Journal of Science and Technology* (2009–2012).

Selected Assignments as Reviewer of Journal Papers

Annals of Applied Statistics, *Applied Artificial Intelligence*, *Asia-Pacific Journal of Operational Research*, *AStA Advances in Statistical Analysis*, *Communications of the IIMA*, *Computational Management Science*, *Computational Optimization and Applications*, *Computational Statistics*, *Computational Statistics and Data Analysis*, *Computers and Industrial Engineering*, *Computers and Operations Research*, *Engineering Optimization*, *European Journal of Operational Research*, *Expert Systems With Applications*, *Flexible Services and Manufacturing Journal*, *German Journal of Exercise and Sport Research*, *IEEE Transactions on Systems, Man, and Cybernetics: Systems*, *IMA Journal of Management Mathematics*, *Information Systems and Operational Research*, *INFORMS Journal on Computing*, *International Journal of Computer Science in Sport*, *International Journal of Forecasting*, *International Journal of Procurement Management*, *International Journal of Production Economics*, *International Journal of Production Research*, *International Journal of Sports Science & Coaching*, *International Transactions in Operational Research*, *Journal of Electromagnetic Analysis and Applications*, *Journal of Heuristics*, *Journal of Modelling in Management*, *Journal of the Operational Research Society*, *Journal of Optimization Theory and Applications*, *Journal of Sports Analytics*, *Journal of Sports Economics*, *Journal of Quantitative Analysis in Sports*, *Manufacturing and Service Operations Management*, *Maritime Transport Research*, *Mathematics*, *Naval Research Logistics*, *Networks*, *Omega*, *Operational Research*, *Operations Research*, *Operations Research Letters*, *Optimization*, *Optimization Letters*, *PLoS ONE*, *Proceedings of the Institution of Mechanical Engineers, Part P: Journal of Sports Engineering and Technology*, *Public Transport*, *Sensors*, *Statistical Methods & Applications*, *Songklanakarin Journal of Science and Technology*, *Sports Economics Review*, *Swarm Intelligence*, *Systems*, *Transportation Research Part E*, *Transportation Science*.

Assignments as External Reviewer of Research Proposals

The Research Grants Council of Hong Kong (2008–2016).

Israeli Ministry of Science, Technology and Space (2015).

Research Foundation Flanders (2015).

National Center for Metropolitan Transportation Research (US) (2010).

Contributions to Organizing Conferences

LINHAC 2022, Linköping, Sweden, June 6–8, 2022 (member of the program committee).

ODYSSEUS 2021/22, Tangier, Morocco, May 4–10, 2022 (member of the scientific committee).

EURO 2019, Dublin, Ireland, June 23–26, 2019 (member of the program committee).

EURO mini-conference on Logistics Analytics, Minsk, Belarus, June 18–19, 2018 (member of program committee).

ODYSSEUS 2018, Cagliari, Italy, June 3–8, 2018 (member of the scientific committee).

LOGMS 2017, Bergen, Norway, August 23–26, 2017 (member of the organizing committee).

ODYSSEUS 2015, Ajaccio, France, June 1–5, 2015 (member of the scientific committee).

LOT, Molde, Norway, September 1–2, 2014 (chair of the scientific committee).

IFORS 2014, Barcelona, Spain, July 13–18, 2014 (session organizer).

VeRoLog 2014, Oslo, Norway, June 22–25, 2014 (member of the organizing and program committee).

MIC 2013, Singapore, August 4–8, 2013 (member of the program committee).

VeRoLog 2013, Southampton, United Kingdom, July 7–10, 2013 (member of the scientific committee).

ODYSSEUS 2012, Mykonos, Greece, May 21–25, 2012 (member of the scientific committee).

EURO XXIV, Lisbon, Portugal, July 11–14, 2010 (session organizer).

TRISTAN VII, Tromsø, Norway, June 20–26, 2010 (member of the scientific committee).

Stochastics in Logistics and Transportation, Håholmen, Norway, June 12–14, 2006 (member of the local committee).

Transportation and Logistics, Molde, Norway, August 25–27, 2004 (member of the local committee).

Other Professional Contributions

Leader of the research committee at Molde University College (since 2023).

Leader of the dissemination committee at Molde University College (since 2023).

Member of the evaluation committee for a promotion to Professor in Supply Chain Management at Molde University College (2023).

Chair of the nomination committee for the positions of Rector and Prorector at Molde University College (2023).

Member of the evaluation committee for the Research Award at Molde University College (2022).

Core member (chair in 2024) of the jury for the EURO Award for the Best EJOR Paper (2022–2024).

Member of the appointments committee at Molde University College (since 2022).

Deputy member of the research committee at Molde University College (2022–2023).

Advisory assistant representing the Norwegian Association of Researchers (Forskerforbundet) in local salary negotiations (2021–2022).

Member of the research committee at Molde University College (2020–2022).

Deputy member of the appointments committee at Molde University College (2020–2022).

Member of the evaluation committee for a PhD scholarship position in Logistics at Molde University College (2019).

Chaired one PhD defence at Molde University College (2019).

Member of the evaluation committee for a position as Professor/Associate Professor in Supply Chain Management at Molde University College (2018).

Member of the expert committee for the Norwegian Operations Research Society award for best Master thesis in the field of operations research (2017–2020).

President of the Norwegian Operations Research Society (2016–2017).

Member of the evaluation committee for a position as Adjunct Associate Professor in Quantitative Health Care Logistics at IØT, NTNU (2016).

Member of the evaluation committee for a promotion to Researcher I position at Møreforsking Molde (2016).

Leader of the Planning, Optimization and Decision Support Group at Molde University College (since 2015).

Member of the Doctoral Degree Committee in Logistics at Molde University College (since 2015).

Chair of the expert committee of Bernt Fossum's Fund for Research within Applied Engineering Economics at the Norwegian University of Science and Technology (2014–2015).

Deputy member of the research panel at IØT, NTNU (2013–2015).

Chaired three PhD defences at IØT, NTNU (2013–2014).

Jury member in the semi-final of TIMES (Tournament In Management and Engineering Skills) organized by ESTIEM NTNU, Trondheim, Norway (2011).

Professional Societies

Member of the EURO Working Group on OR in Sports (since 2016).

Member of the Norwegian Operations Research Society (since 2015).

Member of the EURO Working Group on Vehicle Routing and Logistics Optimization, VeRoLog (since 2011).

Member of the Mathematical Optimization Society (2011–2012).

Member of the Operational Research Society (2008–2009).

Member of the European Chapter on Metaheuristics, EU/ME (since 2004).

Member of the Institute for Operations Research and Management Sciences, INFORMS (2004–2015).

Research Visits

University of Colorado at Boulder, Leeds School of Business, Boulder, CO, USA. Invited by Prof. Fred Glover, September 1–December 20, 2006.

Canada Research Chair in Distribution Management, Montréal, Canada. Invited by Prof. Gilbert Laporte, February 1–May 31, 2006.

Research Projects

CAPSLOCK, collaborative and knowledge-building project on the capacity of transport systems after lockdown, partly funded by the Research Council of Norway. Total budget of NOK 13.5 (2021–2025). Role: project member and PhD supervisor.

FishTraOpt, innovation project on automated and optimized planning for traders of farmed fish, partly funded by the Research Council of Norway. Total budget of NOK 2.2 (2020–2022). Role: project member.

AXIOM, researcher project on the design and analysis of integrated optimization methods, partly funded by the Research Council of Norway. Total budget of NOK 14.7M (2017–2022). Role: project manager at Molde University College and PhD supervisor.

DOMinant II, researcher project on discrete optimization methods in maritime and road-based transportation, partly funded by the Research Council of Norway. Total budget of NOK 14.3M (2011–2015). Role: project member and PhD supervisor.

FAROFF, research and development project on far offshore operation and maintenance vessel concept development and optimization, partly funded by the Research Council of Norway. Total budget of NOK 9.5M (2012–2013). Role: project manager at NTNU.

Resources Utilization in Cloud Computing, collaborative research project, funded by Telenor. Total budget of NOK 0.6M (2011–2012). Role: project member.

DESIMAL, competence building project on decision support systems in maritime logistics, partly funded by the Research Council of Norway. Total budget of NOK 12.8M (2008–2011). Role: postdoctoral fellow.

Educational Projects

Coordinated optimization of ports and ships. Funded by the Norwegian Centre for International Cooperation in Education. Total budget of NOK 0.3M (2017–2018). Role: project coordinator.

Rural logistics. Funded by the Norwegian Centre for International Cooperation in Education. Total budget of NOK 0.3M (2017–2018). Role: network partner.

Development of a multidisciplinary Norwegian-Belarusian study program in logistics analytics promoting Bologna process reforms. Funded by the Norwegian Centre for International Cooperation in Education. Total budget of NOK 5.8M (2016–2019). Role: project member.

Norway-Belarus cooperation in promoting Bologna process standards for higher education within quantitative logistics and information systems in logistics. Seed money, funded by the Norwegian Centre for International Cooperation in Education. Total budget of NOK 0.1M (2015). Role: project member.

Entrepreneurial Projects

Mentor for Zendera AS, a student entrepreneurship project on optimizing transporters' activities, partly funded by the Research Council of Norway with a budget of NOK 1M (2018–2019)

Awards and Grants

Winner of the Research Award 2021 at Molde University College.

One of four nominees to the Prize for Pedagogical Activities at Molde University College in 2019 and 2020.

Co-supervised N. M. Bratsberg and A.-M. Mellbye who won the Norwegian Operations Research Society award for best Master thesis in the field of operations research 2017/2018.

Supervised F. B. Stien who won the national prize for Best Master Thesis in Logistics 2016.

Travel grants from Bernt Fossum's Fund for Research within Applied Engineering Economics at the Norwegian University of Science and Technology, in 2009 and 2010.

Finalist in the 2009 Euro Doctoral Dissertation Award, based on [113].

Honorable Mention in the 2008 Best Paper in Transportation Science & Logistics Award Competition, awarded for [107].

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